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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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		EXAMINER		
		KITOV, ZEEV		
		ART UNIT		PAPER NUMBER
		2836		

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/845,787

Applicant(s)

KUMAGAI ET AL.

Examiner

Zeev Kitov

Art Unit

2836

Am

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2004.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 19 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 6, 10 - 17 is/are allowed.
6) ☒ Claim(s) 1 - 5, 7 - 9, 18, 19 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 01 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

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DETAILED ACTION

Examiner acknowledges a submission of the amendment and arguments filed on July 28, 2004. Claims 1, 2, 4, 6, 7, 10, 14 and 18 are amended. Applicant's arguments have been given careful consideration but they have been found non-persuasive. The rejection follows.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 7 – 9, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cameron (US 6,094,026) in view of Barritt et al. (US 5,648,008). Cameron discloses most of the elements of Claim 1, including following: power semiconductor switching devices (elements 16, 16', 16'', 17, 17', 17'' in Fig. 1); driving means (element 30 in Fig. 1) for driving the switching devices; abnormal condition detecting means (element 40 in Fig. 1) for detecting a fatal abnormal condition (output V hot in Fig. 2) and a precursory abnormal condition (output V warm in Fig. 2) thereof in the switching devices or the driving means; protecting means for protecting the switching devices when the abnormal condition detecting means detects the abnormal condition and abnormal condition output means for outputting signals based on

abnormal condition detecting signals outputted from the abnormal condition detecting means to outside (elements 42 and 45 in Fig. 1).

However, Cameron while disclosing the warning signal does not disclose the alarm signal indicating the fatal abnormal conditions. Barritt et al. discloses the power semiconductor switching devices and the means of the of abnormal conditions detection generating the alarm signal when abnormal condition detecting means detects the fatal abnormal condition (col. 15, lines 1 – 18). As to an output terminal for outputting abnormality factor discrimination signals, according to Barritt et al. (col. 15, lines 12 – 14), “microprocessor responds by generating an alarm signal, which is supplied via conductor 61 (Fig. 2) to an alarm 160 (in Fig. 2),” therefore, the output terminal is an inherent part of the microprocessor.

Both patents have the same problem solving area, namely providing an overload protection for the power semiconductor switching devices. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the Cameron solution by adding the alarm signal, because shutting down the equipment according to Barritt represents an emergency situation and operator should be informed about that.

The claim is presented in a means and function form. According to 35 U.S.C. 112, 6th paragraph, “An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the

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corresponding structure, material, or acts described in the specification and equivalents thereof". (emphasis added).

The "means or step plus function limitation should be interpreted in a manner consistent with the specification disclosure.

Factor that support an equivalency conclusion:

A) The prior art element performs the identical function specified in the claim in substantially the same way, and produces substantially the same results as the corresponding element disclosed in specification. *Kemco Sales, Inc. v. Control Papers Co.*, 208 F.3d 1352, 54 USPQ2d 1308 (FED. Cir. 2000).

B) A person of ordinary skill in the art would have recognized the interchangeability of the element shown in the prior art for the corresponding element disclosed in the specification. *Caterpillar Inc. v. Deer & Co.*, 224 F.3d 1374, 56 USPQ2d 1305 (FED. Cir. 2000).

C) There are insubstantial differences between the prior art element and the corresponding element disclosed in the specification. *IMS Technology, Inc. v. Haas Automation, Inc.*, 206 F.3d 1422, 1436, 54 USPQ2d 1129, 1138 (Fed. Cir. 2000).

Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cameron in view of Barritt et al. and further in view of Shigekane (US 5,115,388). As per Claim 18, it differs from Claim 1 by its limitation of the abnormality factors being discriminated according to combinations of output signals from the respective output terminals. Shigekane discloses the alarm signal being generated as a combination of

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signals from overcurrent protection circuits from the respective output terminals (element G1 in Fig. 1). Both references have the same problem solving area, namely temperature protection for the electronic driving circuits.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Cameron solution by adding the logic summation element for summation of plurality of responses from all the outputs according to Shigekane, because the abnormality can develop in any of the outputs and therefore for comprehensive estimation of abnormality, all the signals should be summed up.

Regarding Claim 19, Shigekane discloses the logic summation of the abnormal conditions detecting signals from the upper and lower arms of the bridge (element G1 in Fig. 1). The motivation for modification of the primary reference is the same as above.

Regarding Claim 7, Barritt discloses cutting off the switching devices when the fatal abnormal condition is developed (through line 60 and transistor 160 in Fig. 1, col. 15, lines 1 – 18). A motivation for modification of the primary reference is the same as above.

Regarding Claims 8 and 9, Cameron discloses the semiconductor switching devices connected in three-phase bridge connection (elements 16, 16', 16'', 17, 17', 17'' in Fig. 1). As to a single-phase connected bridge circuit, it is a part of the circuit presented in Fig. 1).

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Claims 2 – 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cameron in view of Barritt et al. and further in view of M. Mano textbook, Computer System Architecture. As was stated above, Cameron and Barritt et al. disclose all the elements of Claim 1. However, regarding Claim 2, they do not disclose abnormality factor discrimination signals transmitted as serial signals. Mano discloses serial transfer of data between parts of a digital system, specifically between CPU and I/O interface (page 421 – 426). Barritt et al. disclose microprocessor (element 54 in Fig. 2) and other elements of the system are used as peripheral devices. Both references, Cameron and Barritt et al., have the same problem solving area, namely protecting the electronic equipment against over-heating. As to Cameron and Mano references, they have the same problem solving area, namely both deal with digital control systems and methods. Additionally, the Mano reference being a typical college textbook on digital systems and methods provides a basic knowledge, which today is inevitable part of education for one of ordinary skill in the art involved in the electronic systems design.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Cameron solution by adding the serial transfer of the abnormality factor discrimination signals according to M. Mano, because according to M. Mano, the communication between the microprocessor and the peripherals can be done in only one of two forms, either in parallel, or in serial form of transfer and each of these forms has its advantages and disadvantages. The serial transfer is the most popular, because, as well known in the art, (i) it saves the pin count of the chip and (ii) the peripheral equipment usually has the speed much slower than

the speed of microprocessor; for that reason the low speed of the serial transfer is not an obstacle.

Regarding Claim 3, M. Mano discloses a transmission through the same output terminal (Transmit data output in Fig. 11 – 12) variety of messages, carrying different information according to their codes. Therefore, the same output terminal can output both the alarm signals and the abnormality factor discrimination signals having different codes. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Cameron solution by adding the transmission through the same output terminal variety of messages, carrying different information having different codes according to Mano, because this widely used method of transmission saves amount of wires and pin count of the transmitter.

Regarding Claim 4, M. Mano discloses a transmission of the data upon reception of the data request signal (signal RFD in Fig. 11 – 10, pages 421 – 423). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Cameron solution by adding a transmission of the data upon reception of the data request signal according to Mano, because as Mano states, it makes enhances a reliability of the transmission/reception process.

Regarding Claim 5, M. Mano discloses a serial transmission of the data to the peripheral device as including following steps: a transmission preparation signal with a predetermined cycle (page 425 last paragraph), which updates the data to be transferred (abnormality factor discrimination signals) stored in parallel-in/serial-out shift

registers (the upper shift register in Fig. 11 – 12) in the processor output means (abnormal condition output means), and a read clock following the transmission preparation signal (all operations inside the CPU are done according to the clock) causes the shift registers to output the output data (abnormality factor discrimination signals).

Response to Arguments

Applicant in his Arguments attacks Claims 1 and 18 rejections on the basis that not all claims limitations are not taught by each of the references (page 9, lines 5 – 19, 23 – 27). In response to Applicant's piecemeal analysis of the references, it has been held that one cannot show non-obviousness by attacking references individually where, as here, the rejections are based on combinations of references. *In re Keller*, 208 USPQ 871 (CCPA 1981).

As to motivation for combining the references (page 9, lines 20 – 23), each rejection in the Office Action is provided with appropriately formulated motivation.

Allowable Subject Matter

1. Claim 6 is allowed. A reason for that the claimed system while distinguishing between the fatal abnormality and precursory abnormal conditions reacts accordingly and in a case of the fatal abnormal condition, it outputs the alarm signals irrespective of the output request signal, and in the precursory abnormal condition, it outputs the

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abnormality factor discrimination signals separately in time and upon reception of the request signal. Such limitation was not found in the collected prior art of the record.

2. Claims 10 - 17 are allowed. A reason for that is in the following limitation of Claims 10 and 14: "the abnormal condition detecting signals from said abnormal condition detecting means corresponding to semiconductor switching devices connected in bridge connection in an upper arm are transmitted to a lower arm through high voltage level shifters". Such limitation was not found in the collected prior art of the record.

Conclusion

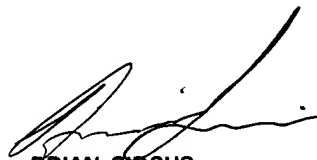
Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zeev Kitov whose current telephone number is (571) 272 - 2052. The examiner can normally be reached on 8:00 – 4:30. If attempts to reach examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (571) 272 - 2836. The fax phone number for organization where this application or proceedings is assigned is (703) 872-9306 for all communications.

Z.K.
10/15/2004

A handwritten signature in black ink, appearing to read 'Brian Sircus', with a stylized flourish at the end.

BRIAN SIRCUS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800